JACKSONVILLE HARBOR DEEPENING STUDY

WATER QUALITY MODELING

Presented by:

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USACE EFDC-CEQUAL-ICM Model Mesh

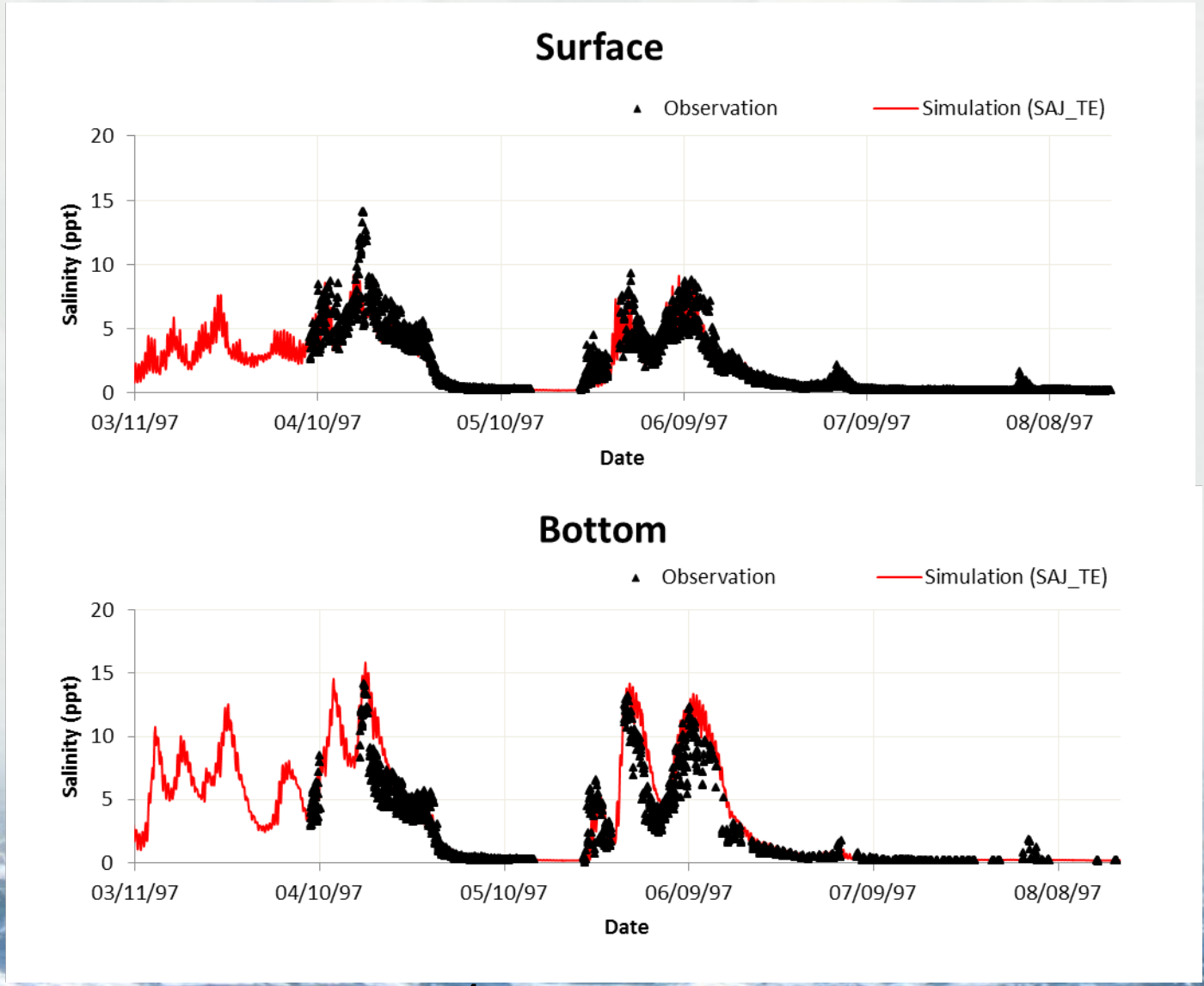
- model domain comprises 2,707 curvilinear horizontal water cells
- six equally divided layers in the vertical direction
- model variables are
  - water surface elevation
  - velocity
  - salinity

EFDC Model Calibration (Salinity)

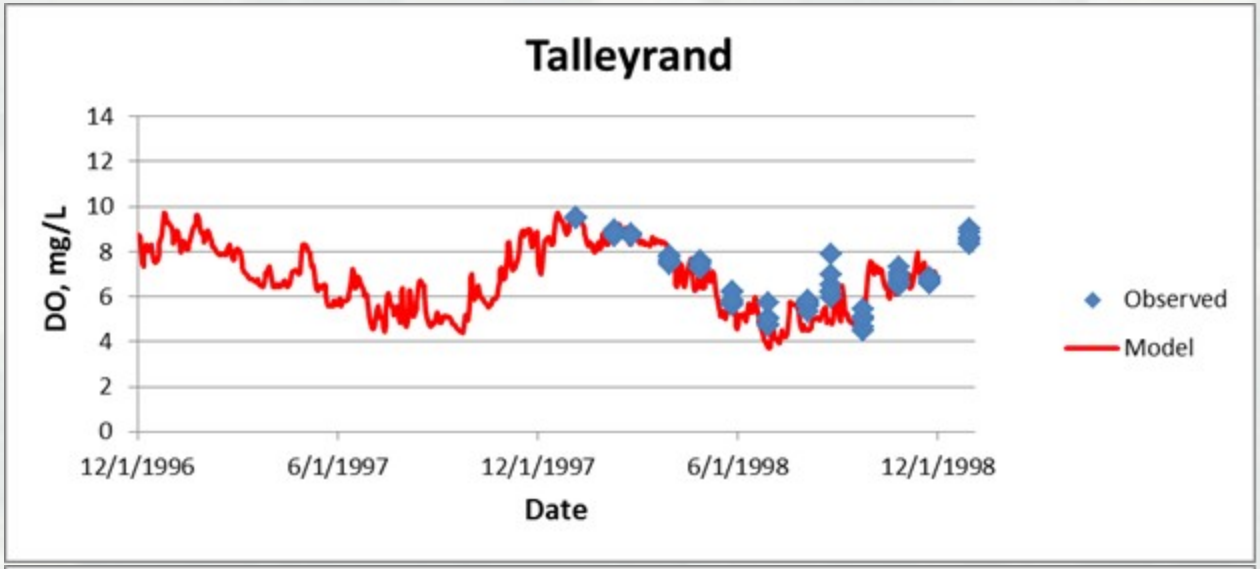
Stations	Calibration Period (1997)		Verification Period (1998)	
	Correlation Coefficient	RMSE (ppt)	Correlation Coefficient	RMSE (ppt)
Dames Point (Surface)	0.911	2.686	0.948	2.385
Dames Point (Bottom)	0.874	4.105	0.883	3.896
Acosta Bridge (Surface)	0.899	2.113	0.972	1.099
Acosta Bridge (Bottom)	0.886	2.433	0.974	1.033
Buckman Bridge (Surface)	0.787	0.986	0.898	0.419
Buckman Bridge (Bottom)	0.962	1.250	0.850	0.538

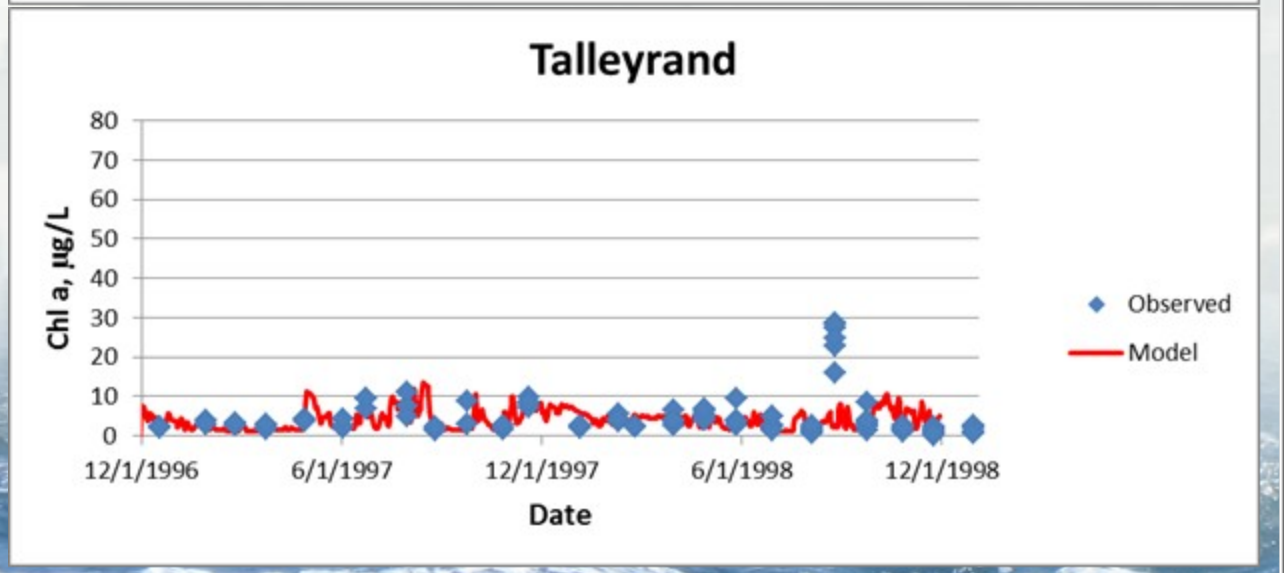
- Correlation Coefficient — ability to predict trend (~ 1.0 for perfect model)
- RMSE — indication of model accuracy (~0.0 for perfect model)

EFDC Model Calibration (Buckman



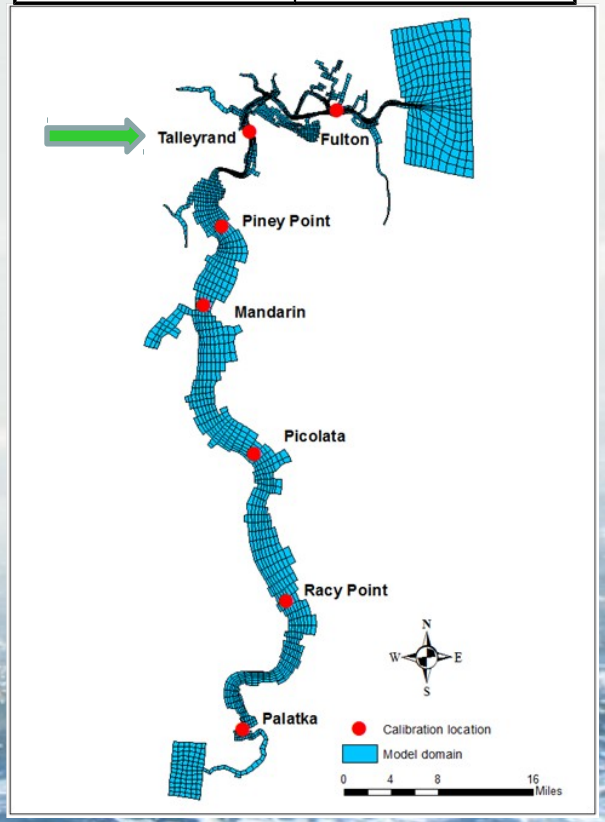
CE-QUAL-ICM Model Calibration





DO Statistic	Refined-Grid Model
R^2	0.61
RMSE, mg/L	1.11

Chl-a Statistic	Refined-Grid Model
R^2	0.50
RMSE, µg/L	11.49



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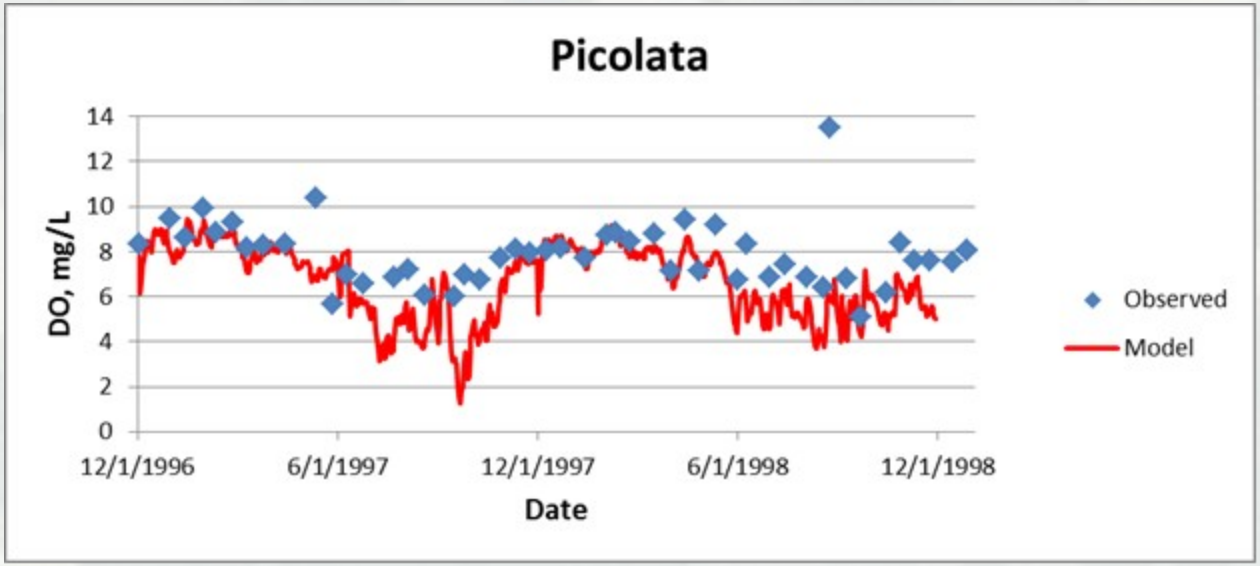

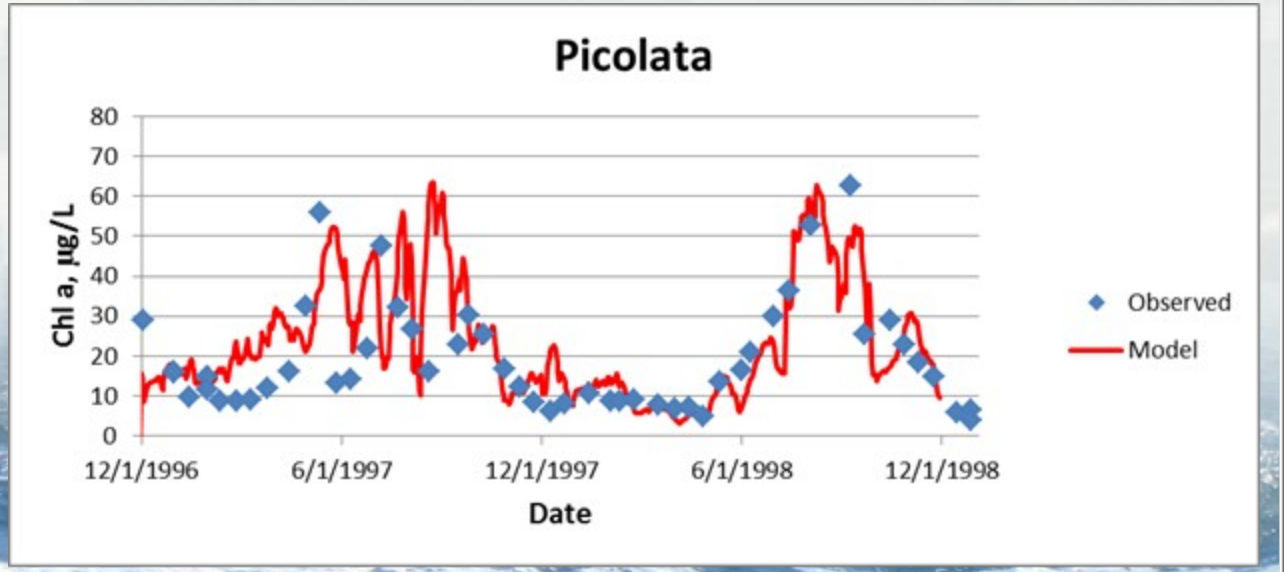

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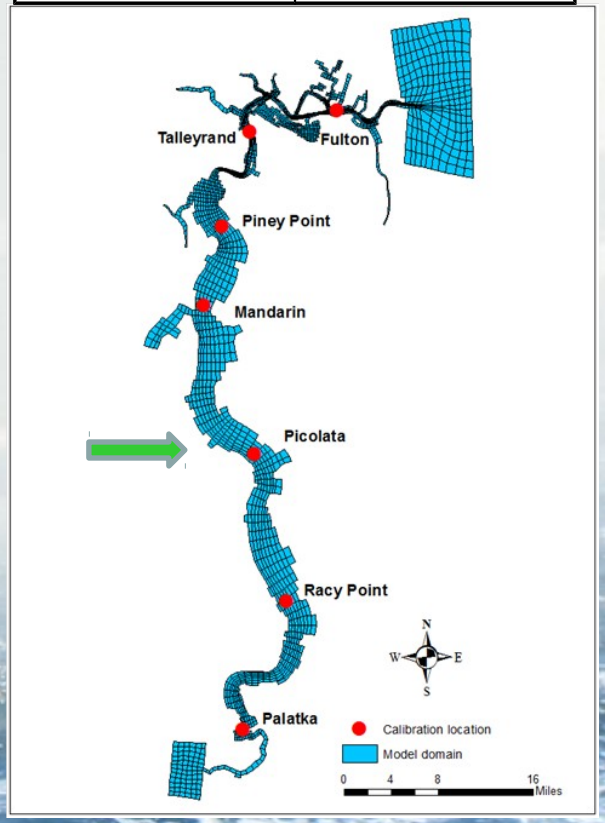
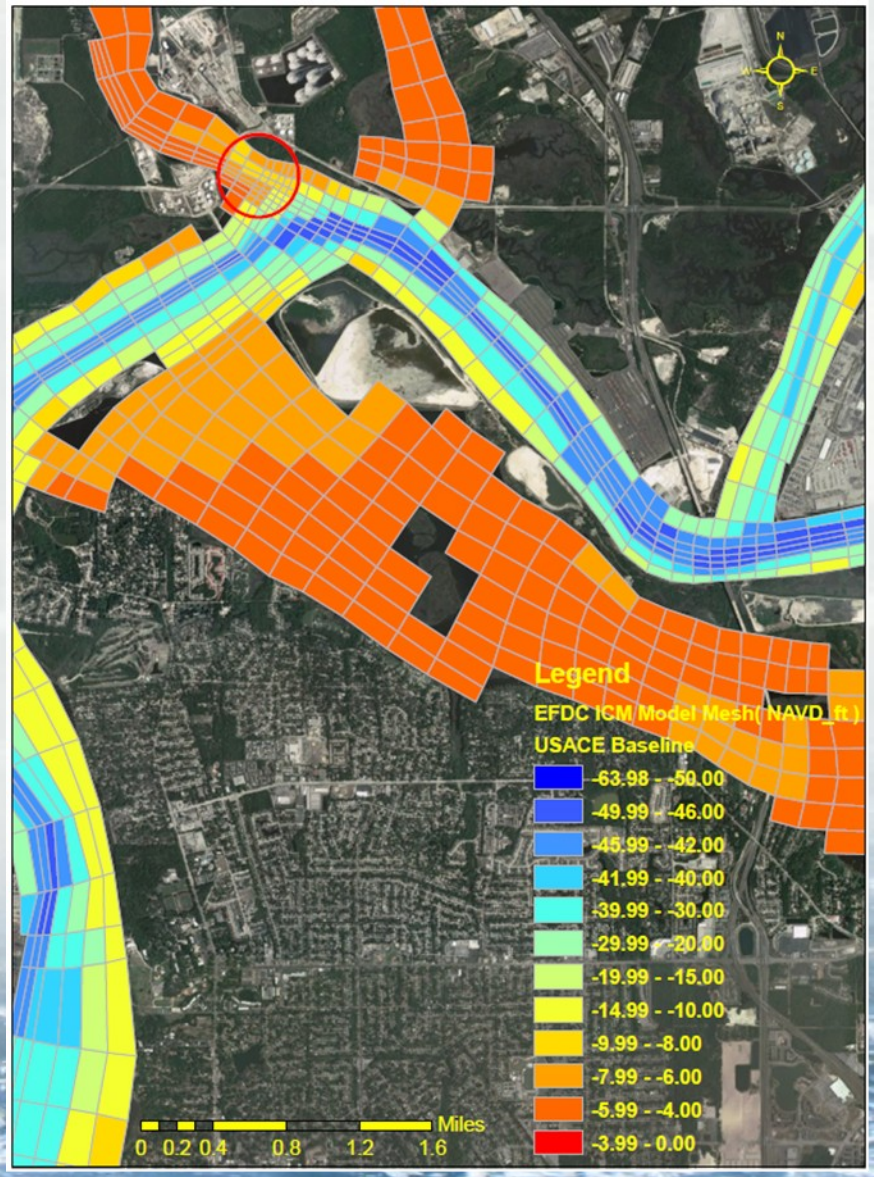


Model Challenges

- Production Runs
  - ► USACE Baseline
  - ► 50-ft dredge
- EFDC-TMDL model has model instabilities for production runs
- Model re-runs with smaller time steps



GRR Water Quality Modeling

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Discussion